

Zachary De Aguiar

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EDUCATION

University of Central Florida

Master of Science in Robotics and Autonomous Systems

Orlando, FL

Aug 2025 – Present

Florida State University

Bachelor of Science in Computer Science, Minor in Mathematics

Tallahassee, FL

Aug 2021 – Dec 2024

EXPERIENCE

Research Assistant

University of Central Florida

Aug 2025 – Present

Orlando, FL

- Develop LLM-based natural language interfaces for industrial robots to convert instructions into executable actions, reducing programming time for non-experts
- Implement NVIDIA Isaac Sim pipelines with robotic arms, conveyors, and ROS2 to validate LLM plans in safety-critical environments
- Collaborate with researchers to apply novel workflows for industrial robot autonomy, extending beyond household applications

Software Engineer

Pulse Solutions LLC

Mar 2021 – Nov 2022

- Engineered a real-time notification system in Go, slashing average latency by approximately 450 ms and boosting overall system responsiveness
- Modernized scraping workflows by addressing bot-protection failures, cutting downtime by 50% and reducing latency by 40%, resulting in significantly more stable data pipelines

PROJECTS

Adaptive Noise-Type Routing for Robust CNN Denoising | *Python*

Aug 2025 – Sept 2025

- Developed a noise-type adaptive CNN that predicts noise present in an image and routes to a specialized denoising branch tuned for Gaussian, salt-and-pepper, Poisson, and other noise types
- Implemented synthetic noise generators and built multi-branch architecture with dynamic routing and blending mechanisms to improve generalization across mixed-noise conditions
- Designed experiments with quantitative metrics (PSNR, SSIM, LPIPS) and qualitative visual comparisons to evaluate performance against a single unified denoiser and demonstrate robustness improvements

Project STORM w/ Robotics Club | *Python, C++, OpenCV, Isaac Sim*

Aug 2025 – Oct 2025

- Collaborated on the development of software for a rover system, focusing on autonomous navigation and control using Python and C++
- Implemented computer vision algorithms for object detection, obstacle avoidance, and path planning, integrating OpenCV and other libraries to process real-time sensor data
- Utilized NVIDIA Isaac Sim for simulation and testing of autonomous driving features, enabling virtual prototyping and validation of rover behaviors in diverse environments
- Optimized code for performance and reliability, contributing to the team's goal of creating a robust, self-navigating rover capable of handling complex terrains and missions

TECHNICAL SKILLS

Programming Languages: Python, C++, C, Go, SQL

Robotics & Simulation: NVIDIA Isaac Sim, ROS2, Gazebo, Ignition

Machine Learning & AI: TensorFlow, PyTorch, Scikit-learn, OpenCV

Control & Systems: SLAM, Path Planning, Motion Control, Sensor Fusion

Tools & Platforms: Git, Docker, Linux, AutoCAD, SolidWorks